Extended Care for Piglets

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I. Abstract

Raising healthy pigs is a key goal for any swine farm, and this plan begins with the newborn piglet. The swine industry recently encouraged farms to consider twenty-four/seven pig care during farrowing (birth), seeking to decrease stillbirth and pre-weaning mortality. The objectives of the present study were to determine the differences between litters raised under an extended care system (Treatment ~16 hours per day) to contemporary litters raised under a typical eight-hour per day (Control) care system. Specifically we wanted to determine if pre-weaning mortality and stillbirth rates were lower in litters receiving extended care. Data were collected on two OSU swine farms, with 20 randomly assigned pregnant sows in the control group and 16 sows assigned to the treatment group. The sows on trial were checked every fifteen minutes during the time of expected farrowing, and records of piglet birth weight and viability were recorded. Assigned farm personnel observed Control sows at farrowing approximately every 30 minutes within a standard workday. Data for total piglets born, total piglets born alive, number of stillborn piglets, and records of death from birth to weaning were collected on all litters. Sows farrowed a similar number of pigs born and number born alive. Results showed a significant (P=0.02) decrease in the number of stillborn piglets per litter when compared with the Control. No treatment sows had greater than one stillborn piglet per litter, whereas, 5 of 20 sows in the Control group had at least 2 stillborn piglets per litter. Treatment did not influence survival to weaning of live pigs. We conclude that extended care shows promise for reducing stillborn rates in piglets, particularly in situations where multiple stillbirths are observed.

II. Introduction

Raising healthy pigs is a key goal for any swine farm, and this plan begins with the newborn piglet. Recently, the swine industry has focused on implementing intensive pig care during farrowing (birth) as a means to decrease stillbirth and pre-weaning mortality. Several articles presented by *National Hog Farmer* focused on approaches to provide extended care on-farm including 24/7-piglet care. Lora Berg suggested that by implementing this protocol on farms, producers could decrease stillbirths from 10% (the industry average) to 2% (Berg, 2014). In addition to decreased stillbirths, providing such care also has demonstrated benefits to decreasing pre-weaning mortality and improving sow well being (Coleman, 2014).

In 1996 White and colleagues examined the affects of farrowing management on piglet survival. Pre-weaning mortality tends to be approximately 15%, and many of these losses are during the first day (White, Anderson, and Bate, 1996). In fact, in the article "Causes of Mortality in Yorkshire Pigs from Birth to 20 weeks of Age" it is stated that 15.3% of piglet mortality happens on day one (Fahmy and Bernard, 1970). Major causes of death include hunger, chilling, and crushing (White et al., 1996). By having human presence during farrowing to assist sows, dry piglets, place piglets near the udder, and help piglets if they are

sat upon immediately influences the major causes of piglet death. This study found that assisting sows at birth reduced stillbirth rates, and starvation rates (White et al., 1996). From these reductions 1.1 more piglets per litter were raised (White et al., 1996).

Edwards agrees with the major causes of death presented in White's paper. Human assistance can decrease mortality by nearly 44% in some cases (Edwards, 2002). However, it is important to consider the economics of hiring additional employees, and the welfare conscious consumer who would rather see pigs raised in larger pens where human intervention is challenging (Edwards, 2002).

This change in management during the farrowing period also has benefits to the compromised piglet. Piglets born relatively undeveloped and who are marginally smaller than their littermates often have low survivability (Milligan, Dewey, and de Grau, 2002). Extended care encourages split suckling. This is a process in which half of the litter is removed for a period of time to allow the other half of the litter to nurse without competition. This allows all the piglets an opportunity for food and colostrum.

Extended care has potentially significant economic impacts as intensive care allows for an additional pig per litter to be raised to weaning. Thus, implementing hands-on farrowing programs may improve piglet survivability, piglet and sow welfare, and profitability for producers.

III. Problem Identification and Justification

In order to help determine the validity of the articles presented by the *National Hog Farmer* we wanted to determine the effects of extended care on piglet pre-weaning mortality, and stillborn rates. By determining differences and number of pigs saved through extended care farm managers can better compare the costs and benefits associated with hiring additional personnel to oversee farrowing beyond the standard eight-hour shift. Past studies of this topic have occurred nearly twenty years ago. This study was necessary to provide up-to-date information to farms considering extended pig care.

IV. Hypotheses and Objectives of the Study

The objectives of this study were to determine differences in pre-weaning mortality and stillbirth rates between litters raised under an extended care system (~16 hours per day) to those contemporary litters raised under a typical eight-hour per day (Control) care system. These differences were found over the course of a year at two of The Ohio State University's swine farms. The null hypothesis was that implementing extended care would not reduce stillborn rate.

V. Materials and Methods

Study Design:

- 36 mixed parity sows located on two OSU swine farms (OARDC Western, and Don Scott Swine Center)

- Treatments:
    - Treatment 1: Randomly selected pregnant sows (n=20) housed in individual farrowing stalls and monitored over an 8 hour period by on-farm staff starting at day 114 of gestation
    - Treatment 2: Randomly selected pregnant sows (n=16) housed in individual farrowing stalls and monitored over a 16 hour period by trained personnel specializing in farrowing management starting at day 114 of gestation
- Data collection:
    - Treatment 1: Sows were monitored every 30 minutes during farrowing (~8 hours/day)
        - Total pigs born, total pigs born alive and number of stillborn pigs were collected 24 hour post-farrowing
        - Number of piglets weaned was collected at 21 days post-farrowing
    - Treatment 2: Sows were monitored every 15 minutes during farrowing (~16 hours/days).
        - Piglets born were dried and placed by the sow's udder to encourage nursing
        - Aggressive piglets were removed to allow compromised piglets the opportunity to nurse (split–suckling)
        - Total pigs born, total pigs born alive, number of stillborn pigs, birth weight and viability were collected immediately at birth
        - Number of piglets weaned was collected at 21 days post-farrowing

Statistical Analysis of Data:

- Data were analyzed using the SAS Software
    - Mixed model procedures were used to test the fixed effect of treatment on piglet and productivity measures
    - Farm was a random effect
    - Stillborn number per litter was adjusted using a linear covariate of total born to account for litter size influences

From this design we were able to determine any differences in pre-weaning mortality and stillbirth rates between litters raised in Treatment 1 and Treatment 2. Therefore, the objectives of the study have been met. This study took place over a twelve-month period, so time was not an issue for the study. The limiting factor was the number of litters analyzed.

VI. Results and Discussion

Results from this study suggest that additional monitoring of sows and supplemental care to piglets did not affect total born, number born alive or number weaned per litter. However, there were fewer stillborn piglets per litter (0.70 pigs per litter; P=0.02; Table 1) when additional care was provided. Additional considerations including economics, employee dynamics and animal welfare need to be evaluated prior to implementing extended care practices on farm.

Extending care and assistance for the sow up to 16 hours/day requires the hiring of an additional shift of workers and will not be economically profitable if the price for labor exceeds the revenue from piglets saved. The current industry average for stillbirth rates is 0.87 pigs per litter (PigCHAMP). Our data indicates treatment difference in stillbirth rate of 0.70 pigs per litter, which, allowing for pre-weaning losses, would result in approximately 0.48 pigs per litter when weaned. Currently, a piglet at weaning age is valued at $48.00. Weaning an additional 0.48 pigs per litter would add an additional $23.04/litter in revenue. In order to reach this stillbirth rate the farm would need to hire an additional employee. The typical farm employee receives $39,000.00 (labor plus benefits) annually. Using cost and expected revenue estimates from the present study, the breakeven point for a farm would be achieved on an 846-sow farm (~1,692 litters per year). Given that many swine farms now are routinely caring for 2,400 sows on a single site, the investment in additional labor appears cost effective.

Prior to adding on more workers to fulfill this additional shift, the farm needs to develop and implement a training program to teach employees effective intervention strategies. Employee attitude is key for the success of such a program including a cohesive, effective and dedicated team.

An additional reason for implementing an extended protocol is one of animal welfare. Even if extended care does not provide an economic incentive, demand from the general public for provision of increased monitoring and assistance of piglets and sows may be required in the future. Ensuring optimal care of animals on farm is important to both the producer and the consumer. Expectations for increased piglet care and monitoring are important considerations.

VII. Conclusions and Recommendations

The data from this study suggests that there are fewer pigs classified as stillborns in litters receiving extended care. Each farm needs to consider several factors including economics, employee dynamics and animal welfare before implementation. Additional studies increasing sample size should also be considered to further validate the impact of extended care on piglet survivability.

VIII. Acknowledgements

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IX. Tables and Graphs

	Trt 1	Trt 2	SE	Prob
Total Born/Litter	10.2	10.1	1.7	0.95
Number Born Alive/Litter	9.2	9.9	1.8	0.60
Stillborn/Litter	1.0	0.3	0.2	0.02

Table 1: Litter Data

X. Bibliography

1 Berg, Lora. "Top 10 Requirements for Attended Farrowings." National Hog Farmer 15 Feb. 2014: 18. Print.

2 Coleman, Larry. "The Ultimate Swine Leadership Challenge." National Hog Farmer 15 Feb. 2014: 20-22. Print.

3 Edwards, S. A. "Perinatal Mortality in the Pig: Environmental or Physiological Solutions?" Livestock Production Science 78.1 (2002): 3-12. Web.

4 Fahmy, M. H., and C. Bernard. "Causes Of Mortality In Yorkshire Pigs From Birth To 20 Weeks Of Age." Canadian Journal of Animal Science 51.2 (1971): 351-59. Web.

5 Milligan, Barry N., Catherine E. Dewey, and Angel F. De Grau. "Neonatal-piglet Weight Variation and Its Relation to Pre-weaning Mortality and Weight Gain on Commercial Farms."Preventive Veterinary Medicine 56.2 (2002): 119-27. Web.

6 White, K. R., D. M. Anderson, and L. A. Bate. "Increasing Piglet Survival through an Improved Farrowing Management Protocol." Canadian Journal of Animal Science (1996): 491-95. Web.

7 "2013 Benchmark Summary - USA." PigCHAMP. Web.